
APPENDIX C APPROVED COUPLING DEVICES

GENERAL

Coupling devices for field joints shall meet the requirements of AASHTO M-36. The devices described herein meet the performance criteria of Division 2, Section 23 of the AASHTO Standard Specifications for Highway Bridges.

JOINT TYPE DEFINITIONS

Standard Joints: - Joints for pipe not subjected to large soil movements or disjoining forces suitable for ordinary installations where simple slip type joints are typically used

Positive Joints: - Joints for pipe which must withstand soil movements or resist disjoining forces such as found on steep slopes, sharp curves, or under poor foundation conditions

SPECIFIC REQUIREMENTS

Approved coupling devices shall be in accordance with attached drawings and shall meet the requirements given in the attached tables for the joint type specified. In addition, the devices shall meet the following requirements:

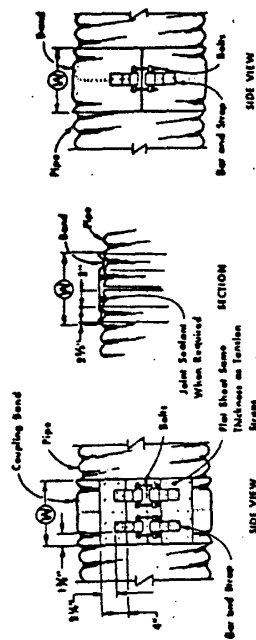
1. Hardware shall be galvanized in accordance with AASHTO M-36.
2. The same minimum bandwidth shall be used for pipe arches, as that required for round pipe of equal periphery.
3. The coupling band shall not be less than 3 nominal sheet **thickness** lighter than the thickness of the pipe. Band **thickness** given in the Tables are minimum for each range of pipe thickness shown.
4. The minimum yield strength of the bar used in the bar and strap connection shall be 32,000 p.s.i. for a 0.079 inch strap thickness and 45,000 p.s.i. for a 0.109 inch strap.
5. Tension straps may be connected to the band with either spot welds or fillet welds that develop the minimum strength of the strap.
6. Lugs used to connect annular bands shall be connected to the band with a fillet weld that develops a strength equivalent to the bending yield strength of the lug as used. Two pairs of lugs shall be used on a 7-inch band.
7. The universal band (dimpled) maybe used only when the grade is 2% or less and shall require a joint sealer, except when the pipe is used for entrances. This band is not allowed when a positive joint is specified.

TABLE 1 - STANDARD JOINTS FOR C.S.P.

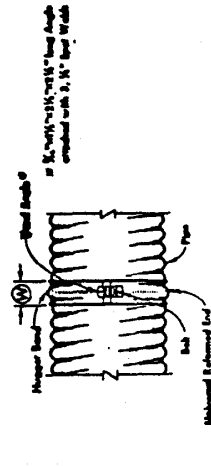
COUPLING DEVICE	PIPE DIMENSIONS			BAND DIMENSIONS			BAND CONNECTING METHOD					
	CORR. SIZE IN.	NOMINAL I.D. IN.	WALL THICKNESS IN.	MINIMUM THICKNESS IN.	MINIMUM WIDTH (W or A) IN.		BAR AND STRAP			BAND ANGLE		
							STRAP THICKNESS IN.	ROVTS NO. & SIZE	BAR EXAM. IN.	ANGLE SIZE IN.	ANGLE LENGTH IN.	ROVTS NO. & SIZE
ANGULAR BAND	3x1	4 1/8x 18	0.284 - 0.128	0.052	7					2x3/8"	7	2 - 3/8"
		3 1/8x 26	0.284 - 0.128	0.052	7					2x3/8"	7	2 - 3/8"
		4 1/8x 36	0.284 - 0.128	0.052	12					2x3/8"	12	2 - 3/8"
		4 1/8x 44	0.284 - 0.128	0.052	24					2x3/8"	24	2 - 3/8"
HELICAL BAND	3x1	4 1/8x 36	0.284 - 0.128	0.052	14					2x3/8"	14	2 - 3/8"
		4 1/8x 44	0.284 - 0.128	0.052	24					2x3/8"	24	2 - 3/8"
		4 1/8x 52	0.284 - 0.128	0.052	25					2x3/8"	25	2 - 3/8"
		4 1/8x 60	0.284 - 0.128	0.052	25					2x3/8"	25	2 - 3/8"
UNIVERSAL BAND (IMPLED)	3x1	4 1/8x 36	0.284 - 0.128	0.052	12					2x3/8"	12	2 - 3/8"
		4 1/8x 44	0.284 - 0.128	0.052	24					2x3/8"	24	2 - 3/8"
		4 1/8x 52	0.284 - 0.128	0.052	25					2x3/8"	25	2 - 3/8"
		4 1/8x 60	0.284 - 0.128	0.052	25					2x3/8"	25	2 - 3/8"
RING CHANNEL BAND	3x1	4 1/8x 36	0.284 - 0.128	0.052	12					2x3/8"	12	2 - 3/8"
		4 1/8x 44	0.284 - 0.128	0.052	24					2x3/8"	24	2 - 3/8"
		4 1/8x 52	0.284 - 0.128	0.052	25					2x3/8"	25	2 - 3/8"
		4 1/8x 60	0.284 - 0.128	0.052	25					2x3/8"	25	2 - 3/8"
CHANNEL BAND	3x1	4 1/8x 36	0.284 - 0.128	0.052	12					2x3/8"	12	2 - 3/8"
		4 1/8x 44	0.284 - 0.128	0.052	24					2x3/8"	24	2 - 3/8"
		4 1/8x 52	0.284 - 0.128	0.052	25					2x3/8"	25	2 - 3/8"
		4 1/8x 60	0.284 - 0.128	0.052	25					2x3/8"	25	2 - 3/8"
FLUORIDE BAND	3x1	4 1/8x 36	0.284 - 0.128	0.052	12					2x3/8"	12	2 - 3/8"
		4 1/8x 44	0.284 - 0.128	0.052	24					2x3/8"	24	2 - 3/8"
		4 1/8x 52	0.284 - 0.128	0.052	25					2x3/8"	25	2 - 3/8"
		4 1/8x 60	0.284 - 0.128	0.052	25					2x3/8"	25	2 - 3/8"
SLEEVE INTEGRAL FLANGE	3x1	4 1/8x 36	0.284 - 0.128	0.052	12					2x3/8"	12	2 - 3/8"
		4 1/8x 44	0.284 - 0.128	0.052	24					2x3/8"	24	2 - 3/8"
		4 1/8x 52	0.284 - 0.128	0.052	25					2x3/8"	25	2 - 3/8"
		4 1/8x 60	0.284 - 0.128	0.052	25					2x3/8"	25	2 - 3/8"
SMOOTH SLEEVE	3x1	4 1/8x 36	0.284 - 0.128	0.052	12					2x3/8"	12	2 - 3/8"
		4 1/8x 44	0.284 - 0.128	0.052	24					2x3/8"	24	2 - 3/8"
		4 1/8x 52	0.284 - 0.128	0.052	25					2x3/8"	25	2 - 3/8"
		4 1/8x 60	0.284 - 0.128	0.052	25					2x3/8"	25	2 - 3/8"

TABLE 2 - POSITIVE JOINTS FOR C.S.P.

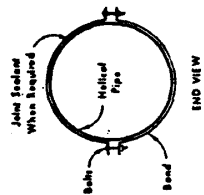
TABLE 2 - POSITIVE JOINTS FOR C.S.P.														
COUPLING DEVICE	PIPE DIMENSIONS			BAND DIMENSIONS		BAND CONNECTING METHOD								
	CORR. SIZE In.	NOMINAL I.D. In.	WALL THICKNESS In.	MINIMUM THICKNESS In.	MINIMUM WIDTH (W or A) In.	BAR AND STRAP			BAND ANGLE					
						STRAP THICKNESS In.	BOLTS NO. & SIZE	BAR DIAM. In.	ANGLE SIZE In.	ANGLE LENGTH In.	BOLTS NO. & SIZE	RIVETS ANGLE TO BAND NO. & SIZE	SPOT WELDS ANGLE TO BAND NO. & SIZE	
ANNULAR or HELICAL BAND	2-2/3x1/2	thru 36	0.064 - 0.136	0.064	12				2x2x3/16	12	3 - 1/2"	3 - 3/8"	5 - 1/2"	
		42 thru 60	0.064 - 0.079	0.064	12				2x2x3/16	12	3 - 1/2"	3 - 3/8"	5 - 1/2"	
		66 thru 84	0.064 - 0.168	0.064	12				2x2x5/16	24	5 - 1/2"	7 - 3/8"	5 - 1/2"	
	3x1	36 thru 60	0.064 - 0.079	0.064	14				2x2x3/16	14	3 - 1/2"	3 - 3/8"	5 - 1/2"	
		36 thru 120	0.064 - 0.136	0.064	25				2x2x5/16	25	5 - 1/2"	9 - 3/8"		
WING CHANNEL BAND	2-2/3x1/2	thru 60	0.064 - 0.168	0.064	12				2x2x5/16	12	3 - 1/2"	5 - 3/8"		
		thru 48	0.064 - 0.109	0.064	12	0.079	2 - 1/2"	7/8						
		42 thru 48	0.136 - 0.168	0.064	12	0.109	4 - 1/2"	7/8						
	3x1	54 thru 68	0.079 - 0.168	0.064	12	D'ble 0.079	4 - 1/2"	7/8						
		66 thru 84	0.109 - 0.168	0.064	12	D'ble 0.109	4 - 1/2"	7/8						
CHANNEL BAND	2-2/3x1/2	36 thru 78	0.064 - 0.109	0.064	12	D'ble 0.079	4 - 1/2"	7/8						
		84 thru 96	0.109	0.079	12	D'ble 0.079	4 - 1/2"	7/8						
		102 thru 120	0.109	0.109	12	D'ble 0.109	4 - 1/2"	7/8						
	2-2/3x1/2	thru 24	0.064 - 0.079	0.079	3/4	0.079	2 - 1/2"	7/8	2x2x5/16	2	1 - 1/2"		3 - 1/2"	
		thru 42	0.064 - 0.079	0.109	3/4	0.079	2 - 1/2"	7/8						
HUGGER BAND	2-2/3x1/2	thru 42	0.109	0.109	1	0.079	2 - 1/2"	7/8						
		48 thru 54	0.064 - 0.079	0.109	1	0.079	2 - 1/2"	7/8						
		thru 36	0.064 - 0.136	0.064	10-1/2	0.079	2 - 1/2"	7/8						
	3x1	42 thru 48	0.064 - 0.109	0.064	10-1/2	0.079	2 - 1/2"	7/8						
		54 thru 60	0.136 - 0.168	0.064	10-1/2	D'ble 0.079	4 - 1/2"	7/8						
2-PIECE INTEGRAL FLANGE	2-2/3x1/2	66 thru 84	0.109 - 0.168	0.064	10-1/2	D'ble 0.109	4 - 1/2"	7/8						
		36 thru 66	0.064 - 0.109	0.064	10-1/2	D'ble 0.079	4 - 1/2"	7/8						
		72 thru 84	0.109	0.079	10-1/2	D'ble 0.079	4 - 1/2"	7/8						
	1-1/2x1/4 2-2/3x1/2	thru 120	0.109	0.109	10-1/2	D'ble 0.109	4 - 1/2"	7/8						
		4 thru 10	0.064 - 0.079	0.064	7							2 - 3/8"		
		8 thru 10	0.064 - 0.079	0.064	7						2 - 3/8"			



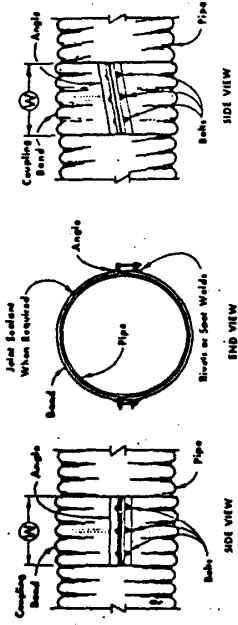
HUGGER COUPLING BAND FOR REFORMED BMD H.C.S.P. ON ANNULAR C.S.P.



4" HUGGER COUPLING BAND WITH BAND ANGLE

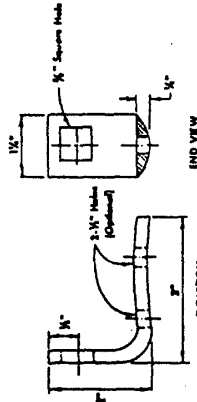
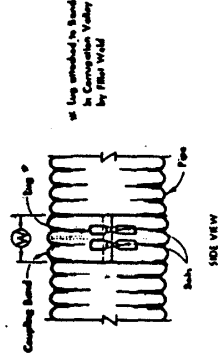


TWO-PIECE INTEGRAL FLANGE
DIE FORMED BAND FOR H.C.S.P.

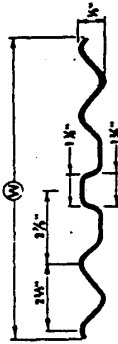
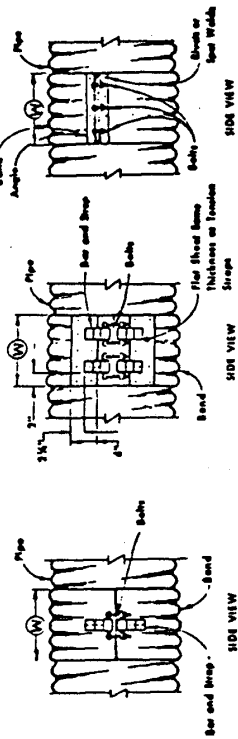


ANNULAR COUPLING BAND

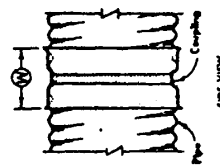
HELICAL COUPLING BAND.
Angle may be varied parallel to pipe
and the desired pitch may be used to
allow adjustment to hole angle.



WELDED LUG COUPLING BAND



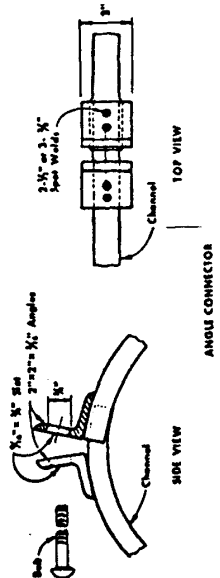
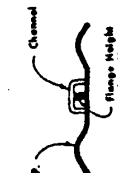
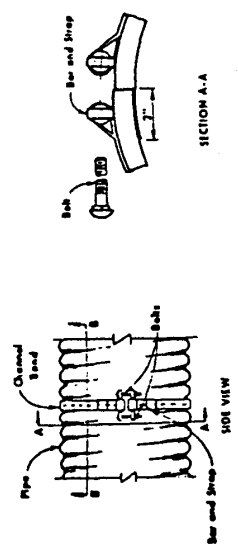
WING CHANNEL COUPLING BAND FOR REFORMED BMD H.C.S.P.



SMOOTH SLEEVE COUPLER

C.S.P. COUPLING DEVICE DETAILS STANDARD AND POSITIVE JOINTS

Sheet 2 of 3



CHANNEL COUPLING BAND FOR USE ON FLANGED END C.S.P.

C.S.P. COUPLING DEVICE DETAILS STANDARD JOINTS

